

PATENT
Docket: NISUS-002-PAP

Application No.: 09/160,728
Examiner: Lance W. Sealey, GAU 2772

IN THE CLAIMS:

Please cancel the claims presently pending in the subject application as revived, and enter the following new claims:

61. A method of presenting, on a computer controlled display device, transformation rules of abstract representations using animations to simulate continuous transformations.

62. A method of teaching transformation rules for abstract symbolic statements using the method of Claim 61.

63. A method of illustrating transformations of abstract symbol statements, comprising:

- a) presenting a first form of an abstract symbol statement on a computer-controlled display device;
- b) presenting a second form of the abstract symbol statement that is a transformation of the first form;
- c) animating portions of the first form of the abstract symbol statement, while other portions of the first form remain static, to indicate conceptual changes involved in the transformation from the first form to the second form of the abstract symbol statement.

64. The method of claim 63, further comprising:

- d) calculating intermediate abstract representations between the first and second forms of the abstract symbol statement; and
- e) animating changes between the first and second forms of the abstract symbol statement by displaying said intermediate representations sequentially on said display device to cause the transformation to appear continuous.

65. The method of Claim 63 wherein the abstract statement is an equation.

66. A method of teaching transformation rules for abstract symbolic statements using the method of Claim 63.

67. The method of Claim 63, further comprising: (d) accepting user input; and (e) changing the computer-controlled display in response to the user input.

68. A method of teaching transformation rules for abstract symbolic statements using the method of Claim 67.

69. The method of Claim 67, further comprising: (f) providing computer-controlled voice explanations synchronized with the animations of portions of the first form of the abstract symbol statement.

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70. A method of teaching transformation rules for abstract symbolic statements using the method of Claim 69.

71. The method of Claim 69, further comprising (g) converting text to speech.

72. The method of Claim 71, further comprising (h) controlling the synchronization of the voice and the animations of portions of the first form of the abstract symbol statement by means of a text script.

73. A method of teaching transformation rules for abstract symbolic statements by using the method of Claim 72.

74. The method of Claim 63 wherein the step (c) of animating portions of the first form of the abstract symbol statement includes one or more animation techniques selected from the group of animation techniques consisting of:

- i) moving a symbol along a prescribed path;
- ii) transforming a first symbol into a second symbol;
- iii) splitting a first symbol into multiple copies;
- iv) fading out a symbol;
- v) fading in a symbol;
- vi) adding pictorial additions to a symbol, and
- vii) removing a pictorial addition that was previously added to a symbol.

75. A method of teaching transformation rules for abstract symbolic statements using the method of Claim 74.

76. The method of Claim 74, further comprising:

- d) accepting user input;
- e) changing the computer-controlled display in response to the user input; and
- f) providing computer-controlled voice explanations synchronized with the animations.

77. A method of teaching transformation rules for abstract symbolic statements using the method of Claim 76.

78. The method of Claim 76, further comprising (g) evaluating context dependent content of the voice explanations.